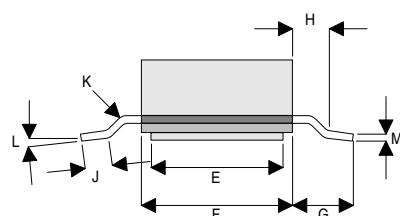
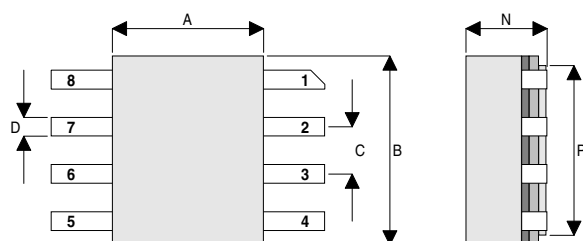


## MECHANICAL DATA



## SO8 PACKAGE

|                |                |
|----------------|----------------|
| PIN 1 – SOURCE | PIN 5 – SOURCE |
| PIN 2 – DRAIN  | PIN 6 – GATE   |
| PIN 3 – DRAIN  | PIN 7 – GATE   |
| PIN 4 – SOURCE | PIN 8 – SOURCE |

| Dim. | mm   | Tol.           | Inches | Tol.             |
|------|------|----------------|--------|------------------|
| A    | 4.06 | ±0.08          | 0.160  | ±0.003           |
| B    | 5.08 | ±0.08          | 0.200  | ±0.003           |
| C    | 1.27 | ±0.08          | 0.050  | ±0.003           |
| D    | 0.51 | ±0.08          | 0.020  | ±0.003           |
| E    | 3.56 | ±0.08          | 0.140  | ±0.003           |
| F    | 4.06 | ±0.08          | 0.160  | ±0.003           |
| G    | 1.65 | ±0.08          | 0.065  | ±0.003           |
| H    | 0.76 | +0.25<br>-0.00 | 0.030  | +0.010<br>-0.000 |
| J    | 0.51 | Min.           | 0.020  | Min.             |
|      | 1.02 | Max.           | 0.040  | Max.             |
| K    | 45°  | Max.           | 45°    | Max.             |
| L    | 0°   | Min.           | 0°     | Min.             |
|      | 7°   | Max.           | 7°     | Max.             |
| M    | 0.20 | ±0.08          | 0.008  | ±0.003           |
| N    | 2.18 | Max.           | 0.086  | Max.             |
| P    | 4.57 | ±0.08          | 0.180  | ±0.003           |

# GOLD METALLISED MULTI-PURPOSE SILICON DMOS RF FET 10W – 28V – 500MHz SINGLE ENDED

## FEATURES

- SIMPLIFIED AMPLIFIER DESIGN
- SUITABLE FOR BROAD BAND APPLICATIONS
- VERY LOW  $C_{rss}$
- SIMPLE BIAS CIRCUITS
- LOW NOISE
- HIGH GAIN – 13 dB MINIMUM

## APPLICATIONS

- HF/VHF/UHF COMMUNICATIONS  
from 1 MHz to 1GHz

ABSOLUTE MAXIMUM RATINGS ( $T_{case} = 25^{\circ}C$  unless otherwise stated)

|              |  |              |
|--------------|--|--------------|
| $P_D$        | Power Dissipation                      | 30W          |
| $BV_{DSS}$   | Drain – Source Breakdown Voltage       | 70V          |
| $BV_{GSS}$   | Gate – Source Breakdown Voltage        | ±20V         |
| $I_{D(sat)}$ | Drain Current                          | 5A           |
| $T_{stg}$    | Storage Temperature                    | –65 to 150°C |
| $T_j$        | Maximum Operating Junction Temperature | 200°C        |

Semelab Plc reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by Semelab is believed to be both accurate and reliable at the time of going to press. However Semelab assumes no responsibility for any errors or omissions discovered in its use. Semelab encourages customers to verify that datasheets are current before placing orders.

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Issue 2

## ELECTRICAL CHARACTERISTICS (T<sub>case</sub> = 25°C unless otherwise stated)

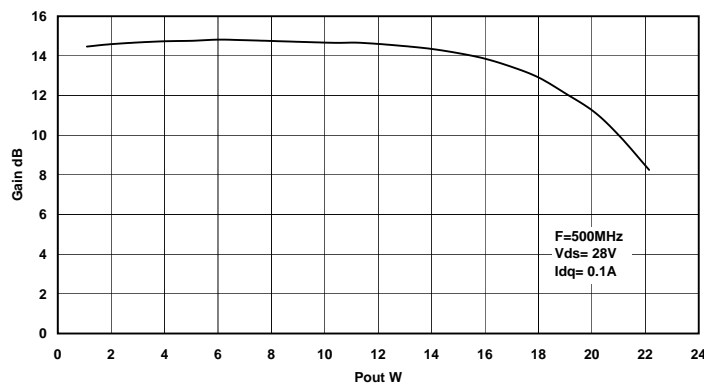
| Parameter  | Test Conditions   | Min. | Typ. | Max. | Unit |
|--|---|------|------|------|------|
| BV <sub>DSS</sub> Drain–Source Breakdown Voltage | V <sub>GS</sub> = 0 I <sub>D</sub> = 100mA              | 70   |      |      | V    |
| I <sub>DSS</sub> Zero Gate Voltage Drain Current | V <sub>DS</sub> = 28V V <sub>GS</sub> = 0               |      |      | 1    | mA   |
| I <sub>GSS</sub> Gate Leakage Current            | V <sub>GS</sub> = 20V V <sub>DS</sub> = 0               |      |      | 1    | μA   |
| V <sub>GS(th)</sub> Gate Threshold Voltage*      | I <sub>D</sub> = 10mA V <sub>DS</sub> = V <sub>GS</sub> | 1    |      | 7    | V    |
| g <sub>fs</sub> Forward Transconductance*        | V <sub>DS</sub> = 10V I <sub>D</sub> = 1A               | 0.8  |      |      | S    |
| G <sub>PS</sub> Common Source Power Gain         | P <sub>O</sub> = 10W                                    | 13   |      |      | dB   |
| η Drain Efficiency                               | V <sub>DS</sub> = 28V I <sub>DQ</sub> = 0.1A            | 50   |      |      | %    |
| VSWR Load Mismatch Tolerance                     | f = 500MHz  | 20:1 |      |      | —    |
| C <sub>iss</sub> Input Capacitance               | V <sub>DS</sub> = 28V V <sub>GS</sub> = –5V f = 1MHz    |      |      | 60   | pF   |
| C <sub>oss</sub> Output Capacitance              | V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz      |      |      | 30   | pF   |
| C <sub>rss</sub> Reverse Transfer Capacitance    | V <sub>DS</sub> = 28V V <sub>GS</sub> = 0 f = 1MHz      |      |      | 2.5  | pF   |
| R <sub>dson</sub> Saturation Resistance          | V <sub>GS</sub> = 20V I <sub>DS</sub> = 2.5A            |      | 1    |      | Ω    |

\* Pulse Test: Pulse Duration = 300 μs , Duty Cycle ≤ 2%

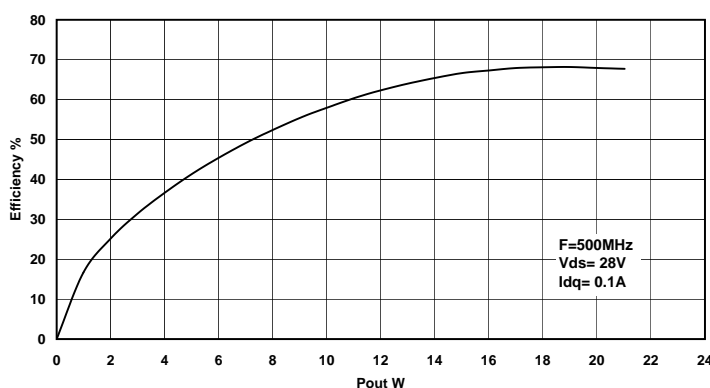
## THERMAL DATA

|                       |                                    |              |
|-----------------------|------------------------------------|--------------|
| R <sub>THj-case</sub> | Thermal Resistance Junction – Case | Max. 6°C / W |
|-----------------------|------------------------------------|--------------|

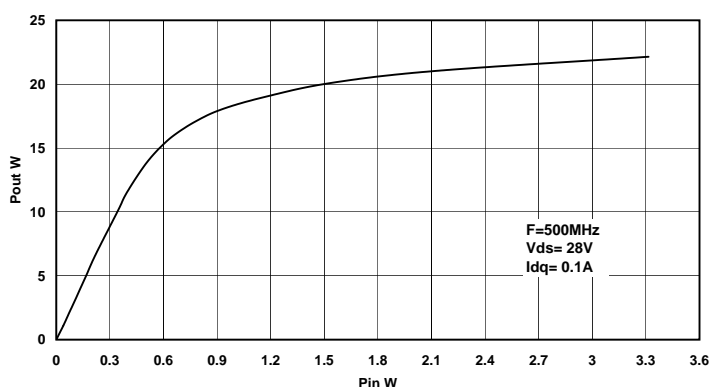
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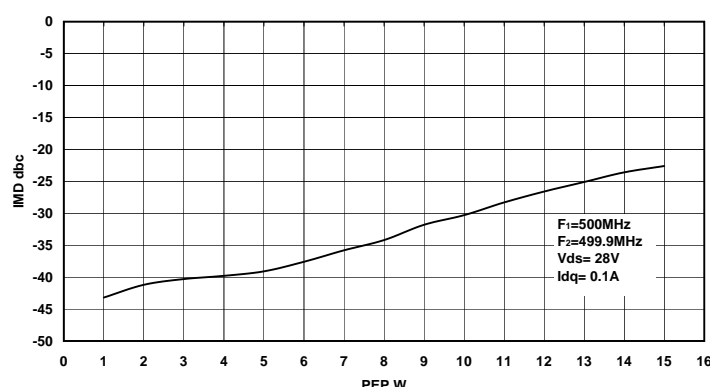
**Figure 1**  
Gain vs. Output Power



**Figure 2**  
Power added efficiency vs. Output Power.



**Figure 3**  
Output Power vs. Input Power.



**Figure 4**  
IMD 3 vs. PEP

## Typical S Parameters

!D1011UK.s2p  
!Vds=28V,Idq=0.1A  
# MHZ S MA R 50

| Freq<br>MHz | S11  |        | S21   |      | S12   |       | S22  |        |
|-------------|------|--------|-------|------|-------|-------|------|--------|
|             | Mag  | Ang    | Mag   | Ang  | Mag   | Ang   | Mag  | Ang    |
| 100         | 0.75 | -114.9 | 12.22 | 61.1 | 0.007 | 108.3 | 0.81 | -139.4 |
| 200         | 0.89 | -147.6 | 3.94  | 32.2 | 0.038 | 111.4 | 0.92 | -158.7 |
| 300         | 0.93 | -161.9 | 2.08  | 20.9 | 0.065 | 102.5 | 0.95 | -166.8 |
| 400         | 0.95 | -173.3 | 1.17  | 14.0 | 0.095 | 94.7  | 0.97 | -173.1 |
| 500         | 0.96 | 179.4  | 0.81  | 11.8 | 0.120 | 89.5  | 0.98 | -177.0 |
| 600         | 0.96 | 172.0  | 0.57  | 12.5 | 0.150 | 84.2  | 0.98 | 179.2  |
| 700         | 0.96 | 166.5  | 0.46  | 15.4 | 0.176 | 80.3  | 0.98 | 176.5  |
| 800         | 0.96 | 161.3  | 0.39  | 19.7 | 0.202 | 76.6  | 0.97 | 174.0  |
| 900         | 0.95 | 155.4  | 0.35  | 25.5 | 0.233 | 72.3  | 0.97 | 171.2  |
| 1000        | 0.95 | 150.6  | 0.34  | 30.0 | 0.260 | 68.9  | 0.96 | 168.9  |

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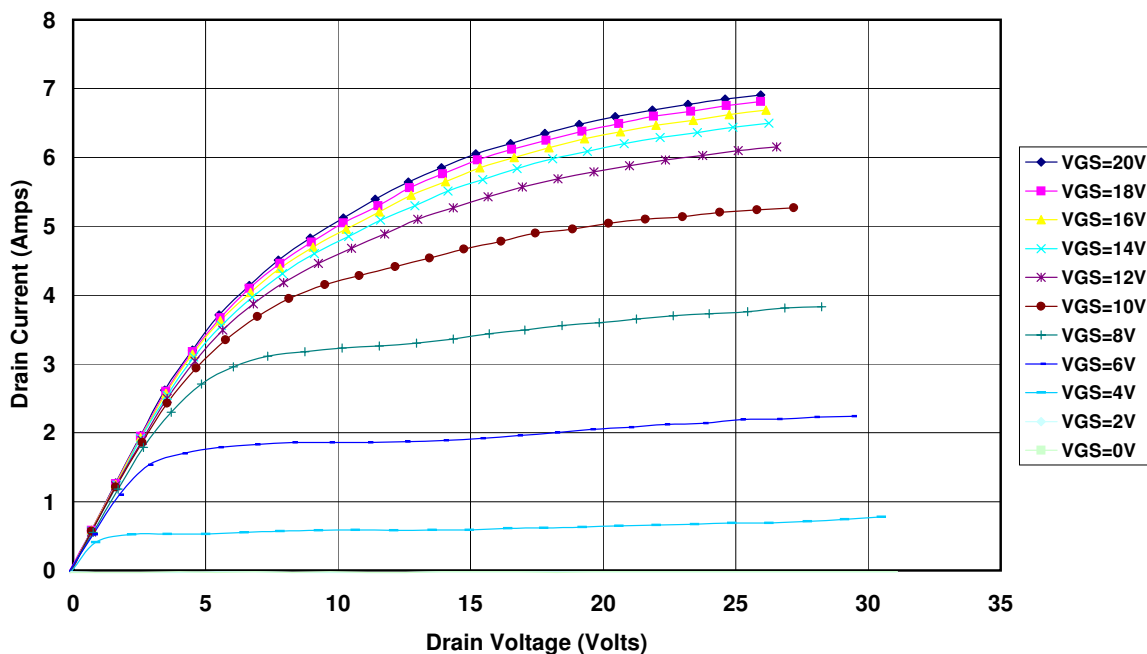


Figure 1 – Typical IV Characteristics.

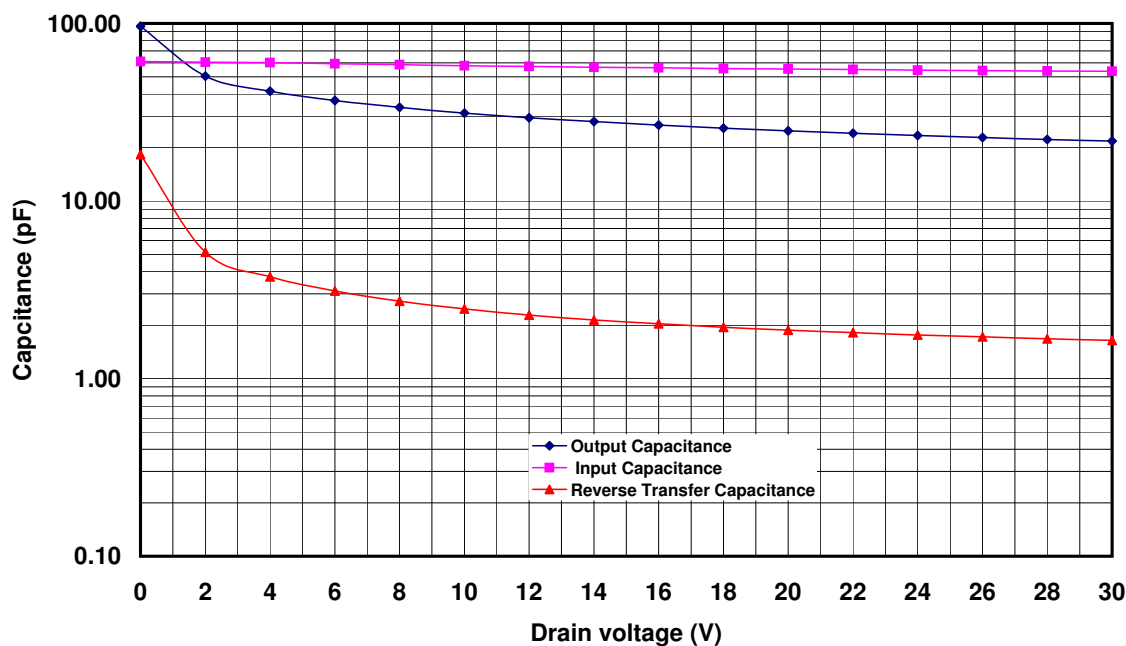


Figure 2 – Typical CV Characteristics.

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L2 1.5 turns 24swg enamelled copper wire on a ferrite